

June 16, 2011

TO: THOSE ON THE ENCLOSED LIST

SUBJECT: SUMMARY OF CATEGORY 1 PUBLIC MEETING WITH BABCOCK AND WILCOX TECHNICAL SERVICES GROUP TO DISCUSS CODES AND MODELING STRATEGIES FOR THEIR MEDICAL ISOTOPE PRODUCTION SYSTEM (MIPS) AQUEOUS HOMOGENEOUS REACTOR

On May 17, 2011, the U. S. Nuclear Regulatory Commission (NRC) staff met with Babcock and Wilcox Technical Services Group (B&W) and other stakeholders at NRC headquarters to discuss the codes and modeling strategies for their medical isotope production system (MIPS) aqueous homogeneous reactor (AHR). A portion of this meeting was closed to the public to discuss proprietary information. Enclosure 1 lists meeting attendees.

The meeting began with an introduction by Ossy Font, Project Manager, NRC stating the purpose of the meeting and pointing out that there would be two meeting sessions, an open meeting for public participation where non-proprietary information would be presented and a closed meeting for proprietary information to be discussed with the NRC staff. The presenters and other attendees introduced themselves. No members of the public participated in the meeting.

Summary

B&W gave presentations to discuss the computer codes and modeling strategy they will use to perform safety analysis for the MIPS. B&W MIPS is an AHR that will be used to produce Molybdenum-99 (Mo-99).

B&W summarized their plans for development and commercialization of the MIPS reactor. B&W briefly presented the MIPS operation from reactor to extraction cycle and back to the reactor. The reactor will run for five days and will be in shutdown mode for two days while the Mo-99 is extracted. Covidien will be the recipient of the Mo-99 produced in the MIPS facility and is one of the two suppliers of its daughter nuclide, technetium 99m (Tc-99m).

B&W then presented the history of the AHR operation experience. B&W also gave a brief summary of the physics that govern AHR operation including the concerns that are important to safe operation. Some of the challenges include boiling, precipitation, radiolytic gases, and gas production physics.

B&W followed the presentation on the physics of AHRs with a presentation on the computational tools they will use to design and perform safety analysis on the MIPS reactor. B&W state that they intend to use 4 computer codes to analyze the MIPS reactor. MCNP and SCALE will be used for static reactor physics analysis and calculation of feedback parameters that will be used in transient system analysis. MCNP is developed by Los Alamos National Laboratory and will be used for design studies. SCALE is developed by Oak Ridge National Laboratory and will be used for safety analysis. WARP is a transient thermal-hydraulic analysis code that includes a point reactor kinetics model to calculate the reactor power. WARP is a

B&W code based on work by Professor M. M. R. Williams from Imperial College of London. FETCH-MIPS is a multidimensional coupled fluid dynamics and neutronics analysis code. FETCH-MIPS is a specialized version of the FETCH code and is developed by Imperial College of London. FETCH-MIPS will be used to help design the B&W MIPS system but it will not be used for safety analysis.

Questions and Comments

NRC staff asked about hydrogen explosions. B&W referenced Atomics International's cube experiment which was allowed to run excursions with closed valves which would represent the recombiners.

NRC staff asked about boiling. B&W stated they did not want sustained boiling. B&W indicate that radiolysis occurs first and as the fuel temperature increases then boiling begins.

Before adjourning the open session of the meeting, the public was given the opportunity to ask questions. NRC staff inquired if there were any members of the public that had joined the meeting after the introduction and if they had any questions or comments. No member of the public had joined the meeting.

B&W's open meeting slides can be accessed through the NRC's Public Electronic Reading Room at <http://www.nrc.gov/reading-rm/adams.html> under Agencywide Document Access and Management System Accession No. ML111580161.

Please direct any inquires to me at 301-415-2490 or electronic mail to Ossy.Font@nrc.gov.

/RA/

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Enclosure: 1. Meeting Attendees

cc w/encl: See next page

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DATE	6/16/2011	6/16/2011	6/16/2011	6/16/2011

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LIST OF ATTENDEES

**CATEGORY 1 MEETING WITH BABCOCK AND WILCOX TECHNICAL SERVICES GROUP
TO DISCUSS CODES AND MODELING STRATEGIES FOR THEIR MEDICAL ISOTOPE
PRODUCTION SYSTEM (MIPS) AQUEOUS HOMOGENEOUS REACTOR**

TUESDAY, MAY 17, 2011

1:00 PM EDT

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Erik Nygaard	B&W
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Paulette Torres	NRR
Lisa London	OGC
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Anthony Attard	NRR
Tamara Powell	NMSS
Jason Lising	NRR
Alexander Adams	NRR
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ENCLOSURE 1